

In the claims:

1. (Currently amended) An isolated DNA molecule ~~comprising a gene encoding~~ that encodes an NADH dependent L-xylulose reductase.
2. (Previously presented) An isolated DNA molecule according to claim 1, wherein the NADH dependent L-xylulose reductase has a catalytic activity for the reversible conversion of a sugar, which bears a keto group at carbon 2 (C2 position), to a sugar alcohol bearing a hydroxyl group at C2 in L-configuration in a Fischer projection.
3. (Currently amended) An isolated DNA molecule according to claim 1, wherein the NADH dependent L-xylulose reductase ~~comprises an amino acid sequence~~ is selected from the group consisting of the enzyme with the sequence of SEQ ID No. NO:2 and a ~~functionally equivalent~~ variant of ~~SEQ ID NO. 2~~ said enzyme that carries out the NADH dependent L-xylulose reductase catalytic activity of the enzyme with the sequence of SEQ ID No. NO:2.
4. (Previously presented) An isolated DNA molecule according to claim 1, wherein the NADH dependent L-xylulose reductase is isolated from a fungus.
5. (Previously presented) An isolated DNA molecule according to claim 4, wherein said fungus is *Ambrosiozyma monospora*.

6. (Currently amended) An isolated DNA molecule according to claim 1, wherein ~~the gene~~ said DNA comprises a nucleic acid with the sequence of SEQ ID No. 1 or a ~~functionally equivalent~~ variant of SEQ ID NO. 1 that encodes a protein that carries out the NADH dependent L-xylulose reductase catalytic activity of the enzyme with the sequence of SEQ ID NO. 2.

7. (Previously presented) An isolated DNA molecule according to claim 1, wherein the NADH dependent L-xylulose reductase exhibits a catalytic activity for reversible conversion of xylulose to xylitol.

8. (Original) A vector comprising the DNA molecule according to claim 1.

9. (Withdrawn) A genetically modified microorganism transformed with the DNA molecule according to claim 1 for expressing said NADH dependent L-xylulose.

10. (Withdrawn) A genetically modified microorganism according to claim 9, **characterised** in that it has an ability to utilise a sugar or a sugar alcohol.

11. (Withdrawn) A genetically modified microorganism according to claim 10, **characterised** in that it has an ability to utilise L-arabinose.

12. (Withdrawn) A genetically modified microorganism according to claim 9, **characterised** in that the microorganism produces

derivatives of at least one of fungal L-arabinose pathway or of pentose phosphate pathway.

13. (Withdrawn) A genetically modified microorganism according to claim 9, **characterised** in that the microorganism contains at least genes of a fungal L-arabinose pathway, which encode enzymes of aldose reductase and of L-arabinitol 4-dehydrogenase, for expression thereof.

14. (Withdrawn) A genetically modified microorganism according to claim 13, **characterised** in that the microorganism contains genes of the fungal L-arabinose pathway, which encode enzymes of at least one of D-xylulose reductase or xylulokinase.

15. (Withdrawn) The microorganism of claim 14 further including genes encoding of D-xylulose of pentose phosphate pathway.

16. (Withdrawn) A genetically modified microorganism according to claim 9, **characterised** in that the microorganism produces at least one of arabinitol, xylitol, ethanol or lactic acid.

17. (Withdrawn) A genetically modified microorganism according to claim 9, **characterised** in that the genetically modified microorganism is a fungus.

18. (Withdrawn) The microorganism of claim 17 wherein the fungus is a yeast or a filamentous fungus.

19. (Withdrawn) A genetically modified microorganism according to claim 18, **characterised** in that the yeast is a strain of

Saccharomyces species, *Schizosaccharomyces* species, *Kluyveromyces* species, *Pichia* species, *Candida* species or *Pachysolen* species.

20. (Withdrawn) A genetically modified microorganism according to claim 19, **characterised** in that the strain is *S. cerevisiae*.

21. (Withdrawn) A genetically modified microorganism according to claim 18, **characterised** in that the filamentous fungus is strain of *Aspergillus* species, *Trichoderma* species, *Neurospora* species, *Fusarium* species, *Penicillium* species, *Humicola* species, *Tolypocladium geodes*, *Trichoderma reesei* (*Hypocrea jecorina*), *Mucor* species, *Trichoderma longibrachiatum*, *Aspergillus nidulans*, *Aspergillus niger* or *Aspergillus awamori*.

22. (Withdrawn) A method for producing a fermentation product from a carbon source comprising a carbohydrate, **characterised** in that the method includes steps of culturing a genetically modified microorganism according to claim 9 in presence of a carbon source under fermentation conditions.

23. (Withdrawn) A method according to claim 22, **characterised** in that the carbon source comprises L-arabinose.

24. (Withdrawn) A method according to claim 22, **characterised** in that the carbon source comprises L-arabinose and the fermentation product is selected from a product of a fungal L-arabinose pathway and a product of a pentose phosphate pathway.

25. (Withdrawn) An enzyme protein which has an NADH dependent L-xylulose reductase activity and comprises an amino acid sequence encoded by a gene of a DNA molecule of claim 1.

26. (Withdrawn) An enzyme protein according to claim 25, **characterised** in that the enzyme protein comprises an amino acid sequence of SEQ ID No. 2 or a functionally equivalent derivative thereof.

27. (Withdrawn) An *in vitro* enzymatic preparation for producing conversion products from a carbon source, **characterised** in that said preparation comprises an enzyme protein which comprises an amino acid sequence encoded by DNA molecule according to claim 1.

28. (Withdrawn) A method of conversion of a sugar comprising contacting the sugar with an NADH dependent L-xylulose reductase enzyme, comprising an amino acid sequence encoded by a gene of a DNA molecule of claim 1, wherein the sugar has a keto group at C2 position and is converted to a sugar alcohol with a hydroxyl group at C2 in L-configuration in a Fischer projection, or for reversed conversion thereof.

29. (Withdrawn) The method of claim 28, characterised in that the enzyme is produced by a genetically engineered microorganism in a fermentation medium which comprises the sugar or the sugar alcohol, in fermentation conditions that enable conversion by said enzyme.

30. (Withdrawn) The method of claim 28, **characterised** in that the conversion is an *in vitro* enzymatic conversion.

31. (Previously presented) An isolated DNA molecule comprising a gene encoding an NADH dependent L-xylulose reductase, wherein the gene encodes a protein having the amino acid sequence of SEQ ID No. 2.

32. (Previously presented) An isolated DNA molecule comprising a gene encoding an NADH dependent L-xylulose reductase, wherein the gene comprises the nucleic acid sequence of SEQ ID No. 1.